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REPORTS

OF THE

SECRETARY OF THE NAVY,

AND THE

COMMISSION BY HIM APPOINTED,

ON THE PROPOSED

NEW IRON NAVY YARD

AT

LEAGUE ISLAND.

PHILADELPHIA:
COLLINS, PRINTER, 705 JAYNE STREET.
1863.

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REPORTS

OF THE

SECRETARY OF THE NAVY,

ERRATA.

Attention is called to the following corrections, which should have been made in the original copy when printed by the Senate:—

On p. 11, eleventh line from bottom, *for* "Gasper Point" *read* Gaspee Point.

On p. 12, twenty-second line from bottom, *for* "which raise a chopping sea, and is in some places exposed to" *read* which raise a chopping sea, is in some places exposed to ice, and is defective &c.

On p. 14, twenty-first line from top, *for* "winds at sea" *read* winds and sea.

On p. 16, twenty-first line from top, the number of acres is erroneously stated to be "219." The survey of 1709 shows the island to have contained 262 acres.

On p. 17, ninth line from top, "7.5 feet," as originally printed, should be 5.7 feet, as in text.

On p. 33, the language of the second paragraph is obscure. By supplying the ellipsis, it would read "to close the Delaware *at the city* occurs but once in ten years, and that the river is closed *at and below League Island* but once in forty years."

On p. 50, seventh line from top, *for* "changes" *read* construction.

PHILADELPHIA:
COLLINS, PRINTER, 705 JAYNE STREET.
1863.

REPORTS ON THE NEW NAVY YARD.

THE United States Senate called for and printed the Report of the Commission appointed by the Secretary of the Navy to examine League Island, the site proposed by him, and other sites proposed in Congress when authority was asked to accept the title to League Island. The Secretary's Report on the action of this Commission is here reprinted, with both the majority and minority reports of that Commission, in order to place these documents fairly before the public. Particular attention is asked to the conclusive reasons presented both by the Secretary, and by the minority of the Commission, for adhering to the original selection of League Island.

REPORT OF THE SECRETARY OF THE NAVY.

(EXTRACT FROM THE ANNUAL REPORT.)

IN March last, and again in June, I invited the attention of the Naval Committees of Congress to the importance of taking prompt preliminary measures for establishing a navy yard, including foundries, shops, and docks, adapted to the growing wants of the service and the country. It was not that we needed an additional navy yard, but that we required one of a different character, in many respects, from any that we possess.

In view of the importance of possessing, somewhere in this country, a navy and dock yard for the purposes of an iron navy, the suggestions of the Department received the favorable consideration of Congress. The city of Philadelphia, the commercial centre of the iron and coal regions, became interested in the question, and was induced to make a free offer of League Island, a body of land of about six hundred acres, near the confluence of the Delaware and Schuylkill Rivers, to the United States, for naval purposes. In consequence of this liberal offer, Congress authorized the Secretary of the Navy to receive and accept League Island: provided, however, that it should not be accepted

until the title shall be perfect to low-water mark, nor if, upon a more thorough examination and survey of the premises by a competent board of officers, to be appointed by the Secretary of the Navy, he shall discover that the public interests will not be promoted by acquiring the title as aforesaid; that the board to be appointed shall, before proceeding to any decision of the questions referred to them, make a survey and examination of the harbor of New London, in Connecticut, and its surroundings, with reference to its fitness for a naval depot and navy yard; and that they also make the same investigation in regard to the waters of Narraganset Bay.

Pursuant to the requirements of the act of Congress above referred to, I appointed, on the 12th of August, a board of officers consisting of Rear Admiral Stringham, Commodores Van Brunt and Gardner, and Captain Marston, of the navy, Professor Bache, and Engineer Sanger, to make the required examination and report. The board was assiduously engaged for over two months upon the duty assigned it, and after completing the survey and examination, revised their labor; and, upon a full discussion of the subject, the members unanimously rejected any proposition for the contemplated navy yard on the waters of Narraganset Bay. In regard to the two other locations, League Island and New London, and which is best adapted to the purposes of such a navy yard and depot as is contemplated by the law, the board was divided in opinion, and presented majority and minority reports. The majority, comprising four members, award to New London the preference over League Island for a navy yard. The minority as fully and emphatically give their preference to League Island as possessing important requisites which the other does not, and as being better adapted to the special wants of the Government, and the objects of the law authorizing the appointment of the commission.

Without attempting, in this place, to analyze these voluminous reports, or to reproduce the arguments adduced by each, I have considered it my duty to bring the subject to the attention of Congress, and to reiterate my opinion in favor of a new yard and depot better adapted to the construction of iron vessels and iron-clad vessels than any we now have, and where this description of vessels may be repaired, or, in time of peace, laid up in ordinary. In selecting the site for such a navy yard there are two essential and controlling considerations that must govern. One is the very great advantage (if not absolute necessity) of fresh water over salt water for the preservation of iron vessels. The other is, security from an attack by a foreign enemy. These two primary qualities are to be had at League Island. Iron and coal are also in close proximity to that location.

New London has a commodious harbor, and, were it less

exposed, some good qualities for a navy yard, provided it be the intention of Congress to establish another similar to those we now have for the construction of wooden vessels. For an iron navy, and for iron purposes, I am not aware that it has any advantages over Brooklyn, or Charlestown, or Portsmouth; and if not, Congress must determine whether another such yard shall be established. The Department has not suggested or contemplated the acquisition of a yard and depot of that description, but called attention to the growing necessity of an establishment for an iron navy. The law, while requiring an examination of other places by a board, authorizes no action by the Department for the acceptance of any other than League Island, and I do not, therefore, propose to canvass the merits or demerits of New London or Narraganset Bay.

League Island has the requisite of fresh water, which is indispensable for an iron navy yard; and is remote from the sea, which renders it a place of security. The objections to it are its low, alluvial soil, the cost of raising it to a proper grade, the depth it will be necessary to penetrate before reaching safe bottom, and the expense of piling, on which to erect superstructures. These are weighty objections, and it will require no inconsiderable expenditure to overcome them. In addition to those above enumerated, is the fact that the navigation of the Delaware River is sometimes obstructed by ice, and injury is sometimes caused by floating ice; but there is no river east or north of it where the objection is not much greater.

In regard to the location of naval depots, and the necessity of having them secure from foreign enemies, I cannot more distinctly and clearly present what are the requisites than by quoting from the report of a very able board of eminent officers and engineers on seacoast defences, made in 1820:—

"Security against an attack by sea or land is undoubtedly the first condition required; for the destruction of an establishment of this nature involves with it the destruction of all those elements of a naval force which have been collected a long time beforehand during peace, to the incalculable loss of the public. Such a misfortune must be severely felt during the whole course of a war, and cannot well be repaired whilst it continues. This indispensable quality (security) must be obtained, as well as localities will admit, without having recourse to artificial fortifications; for these must be very costly, and, if that expense can be avoided, the same sums will be much more advantageously laid out in improving and aggrandizing the establishments of the depot. Thus, if equal in other respects, a place whose site is naturally strong, and whose position with respect to the general frontier is well covered, should be preferred to another that requires to be fortified."

The great essential here specified, of security from attack by a foreign enemy, appertains to League Island, which has, in that respect, strong topographical advantages. Its interior location might have constituted an objection at a former period, when only sailing vessels were in the naval service; but the introduction of steam has wrought a revolution in this respect, rendering the movements of our war vessels independent of wind and tide. Immediate contiguity to the ocean is no longer deemed an advantage, but a disadvantage. Steam, rifled cannon, and modern improvement in ordnance, have rendered harbors and depots immediately on the seaboard insecure. In a recent debate in the British Parliament, it was emphatically urged that Portsmouth and its immense and costly works must be abandoned, for the reason that a naval depot should not be within the range of five or six miles of an attacking force. If, then, fresh water be indispensable for a navy yard for the construction, repair, and dockage of iron vessels, and vessels that are clad with iron, there is no position east of the Delaware where the difficulties from ice do not exceed those urged against League Island, nor has any place been proposed that presents equal advantages, or is so secure from an attack.

While there are some obvious and admitted objections to League Island, no place has been proposed that combines so many advantages, unless it be the contracted and altogether inadequate yard at Philadelphia. That yard may, perhaps, be extended so as to double its present capacity, but, besides involving a large expenditure, it would then be insufficient for our future iron navy.

The occupation of League Island would not increase the number of navy yards that we now have, for, when once in operation, the discontinuance of the present site at Philadelphia would take place as a matter of course, and the avails could be, and doubtless would be, diverted to the improvement of the new location; whereas, the adoption of any other site would be the addition of another navy yard similar in character to those we now have, which is not required.

The conflicting reports, and the conditions annexed to the law authorizing the Secretary of the Navy to receive and accept League Island, have occasioned embarrassment, and I have therefore deemed it respectful to delay action until Congress should convene. As neither the harbor of New London nor the waters of Narraganset bay are adapted to the purposes and wants of an iron navy, whatever may be their advantages in other respects, and as League Island has the requisites of fresh water, security from external enemies, and proximity to iron and coal, I propose to receive and accept for the Government the munificent donation of the city of Philadelphia, unless Congress shall otherwise direct.

MATERIAL.

The time has arrived when, in order to maintain ourselves and our true position as a nation, we must have a formidable navy, not only of light-draught vessels to guard our extensive and shallow coast, but one that, with vessels always ready for the service, and of sufficient size to give them speed, can seek and meet an enemy on the ocean. In order to obtain the enormous steam power essential to great speed, we must have vessels of the greatest magnitude.

Vessels of wood will always be built; but the causes that have operated to retard the introduction of iron vessels are disappearing. The working of iron has been much simplified; its application facilitated; new tools and machinery for working it are constantly being invented and improved; artisans skilled in its manufacture are becoming more common, and the material more easily wrought.

The progress of events renders it certain that iron will hereafter enter largely into the structure of vessels for marine service, although it will never entirely supersede wood. Our country produces the material in abundance, and we have no occasion to seek it from abroad. While our forests are disappearing, inexhaustible resources in iron are being developed. That it is for the interest of the Government to be prepared to meet some change in the material and structure or our naval vessels need not be repeated. It must provide the necessary yards and establishments for each, and have them properly located, in which to build its ships-of-war, and at least one of them should be specially adapted to iron. No private establishment can undertake such heavy work as the Government requires for its armor and steam purposes. Possessing advantages that no other nation enjoys, we should avail ourselves of them. Our iron and coal are found in the same region, and we have fresh water rivers in which iron vessels can be docked and kept clean, and from which all enemies can be excluded.

In the construction of the iron and iron-clad vesse[illegible]hich the Department has now in progress, every effort has been made to have them promptly completed. It is believed that nearly every rolling-mill has been engaged that is able to do the work; and yet these vessels are several months behind the time within which they were to have been completed. The Department is convinced that the contractors have done their best; and yet it is with great difficulty that these comparatively small vessels and the moderate-sized iron required can be procured for them as soon as wanted, so much does the demand exceed the capabilities of the mills to supply. These facts demonstrate the necessity for public works where vessels of great magnitude are to be constructed. Had

the Government been prepared for this heavy work, much of the delay which has embarrassed naval operations might have been avoided. Private establishments would have been relieved, and enabled to furnish a larger quantity within the scope of their own manufacture.

It is as important that the Government should build its own ships of iron as of wood. If the apparent cost in either case is greater, the actual value is also greater. It is of the first importance that the material, whether of iron or wood, should be of the best quality; and as regards iron, this can be insured and made certain only by its being received and reworked at Government establishments. The large quantities required will always enable the Government to purchase on economical terms. It is well understood that the qualities of iron vary greatly, and the use of inferior kinds will be both injurious and expensive. Experiments with shot in target practice demonstrate that some qualities have much greater powers of resistance than others, and are therefore better for armature. Other qualities may better resist corrosion, and be more suitable to the action of sea water, and still others may be adapted to the internal parts exposed to different chemical action. These qualities and denominations will be ascertained by observations and tests that the Government can alone well make and faithfully apply in the construction of its war vessels. Contractors and private establishments will not be equally vigilant and careful in making the proper selections and assortings.

An establishment such as the Department has in view, and has heretofore recommended, will enable the Government to have all the advantages of the best and most suitable descriptions in the construction of vessels of iron and iron armature. Steam machinery, anchors, chain cables, and heavy iron work for the naval service, would be manufactured at the same establishment to advantage.

The necessity of such a dock-yard and establishment is becoming so important that I deem it proper again to present the subject to the consideration of Congress. As yet we have but few iron vessels, and these chiefly of foreign construction; but we have built and are building iron-clad vessels at private establishments—not one at our public yards.

In sustaining our position as a naval power we must be prepared for reverses that may befall us in battle or by calamities incident to ocean service. A wise precaution will always provide a reserve of ships to take the place of those that may be injured or destroyed. Vessels should be in different stages of progress of construction, thereby giving constant employment to a certain number of skilful mechanics. Stores of material can well be accumulated in days of peace for the emergencies of war.

Such was the former policy of the Government, and for many years an annual appropriation was made for the gradual increase of the navy. Under this policy there were, in times of peace, large accumulations of material at the different yards. It was from the stock thus collected and seasoned that our vessels were mainly built.

Gradually this policy was changed. Successive Administrations, with a view to the appearance of economy, and a show of small expenditure, restricted the estimates for supplies to amounts barely sufficient to keep its few ships afloat.

The war found us literally destitute of materials in our navy yards, as well as with but few ships to sustain the national integrity. From mistaken economy, or from design, the Government was, in its need, deficient in ships, and destitute of material for their construction. No alternative was left, when resistance was made, but for the Department to build its vessels as speedily as possible, and of such timber as could, in the great haste and emergency, be procured. As a consequence, vessels that should have lasted for years will soon perish, and must, in the meantime, involve heavy expense for necessary repairs in order to keep them afloat.

As vessels of wood will always be used to some extent for naval purposes, and as they can, for the present at least, be constructed more speedily than of iron, it will be wise economy to have a reasonable quantity of timber always in store.

A special appropriation annually for the purpose of accumulating a stock of material must always be advantageous to the Government. In that way the navy can be best and most economically supplied, can make better purchases, and have more time to examine and test the deliveries.

DOCKING.

Our facilities for docking ships are altogether inadequate to our naval wants, and in a foreign war with a formidable Power our condition would be deplorable. We have but one dry-dock at each naval station, and three of our six docks are of wood, being both perishable and combustible. The capacity of these docks is much below the size required for some of the vessels we are now building, and such as we must build for the future. Other nations, finding themselves in a similar condition, are now enlarging their dry-docks; and we, having but three permanent ones, and they designed for vessels of less dimensions than some we now build, should have new and suitable ones, and their construction should be forthwith commenced. Some of them should be at least 550 feet in length, with a breadth of 80 feet, to admit of large increase. Docks of wood are too perishable, and require

greater depth of water for heavy ships than our harbors can furnish.

The importance of constructing wet basins at such of the navy yards as are sufficiently capacious to admit of it, adverted to by the Chief of the Bureau of Yards and Docks, is commended to the consideration of Congress.

LETTER OF THE SECRETARY OF THE NAVY,

COMMUNICATING,

In answer to a Resolution of the Senate of the 2d instant, the Majority and Minority Reports of the Board of Officers appointed under the Act approved July 15, 1862, entitled "An Act to authorize the Secretary of the Navy to accept the Title to League Island, in the Delaware River, for naval purposes."

DECEMBER 17, 1862.—Read, referred to the Committee on Naval Affairs, and ordered to be printed.

NAVY DEPARTMENT, *December* 16, 1862.

SIR: In compliance with the resolution of the Senate of the 2d instant, I have the honor to communicate herewith "copies of the majority and minority reports of the board of officers appointed in accordance with the provisions of an act of Congress approved July 15, 1862, entitled 'An act to authorize the Secretary of the Navy to accept the title to League Island, in the Delaware River, for naval purposes.'"

Very respectfully, your obedient servant,

GIDEON WELLES,
Secretary of the Navy.

HON. H. HAMLIN,
Vice-President of the United States and President of the Senate.

MAJORITY REPORT.

UNITED STATES NAVY YARD,
Philadelphia, October 24, 1862.

SIR: The board appointed to examine the harbor of New London, Narraganset Bay, and League Island, and to report whether, in their opinion, the public interests will be promoted by acquiring the title to League Island for naval purposes, or by establishing a navy yard and naval depot either in or near the harbor of New London or in the waters of Narraganset Bay, instead of League Island, has the honor to report, that in accordance with your order of August 12, 1862, the board met at New London on the 26th August, and proceeded to make a thorough and careful examination of that harbor and its surroundings. Having completed this examination, the board proceeded to Narraganset Bay and made a minute examination of its waters. After which they visited League Island, and have devoted much time in investigating its qualities for a naval station.

NARRAGANSET BAY.

The list of materials collected in reference to this bay will be found in Appendix No. 1.

As required by our instructions, we examined and surveyed the extensive waters of this bay, visiting all the sites which had been suggested by the examinations of previous boards or by more recent surveys by the Coast Survey, which were suggested by local authorities or which appeared in our inspection of the bay to present promising positions for a navy yard.

Thus we examined Mount Hope Bay and its approaches in by the channel, between Bristol and Rhode Island, down to the old stone bridge, which now closes the eastern passage of the bay (sometimes called Saughkonnet River), and out by the northern shore of the island of Rhode Island into the main channel of Narraganset Bay. Providence River, especially near Gasper Point, was examined. The whole of the eastern side of Prudence Island was very carefully examined, especially south of Sandy Point and in Potter's Cove; the western shore of Rhode Island behind Dyer's Island; the eastern shore of Connanicut, surveying Taylor's Cove, which is protected in part by Gould Island from winds, currents, and ice; visiting Newport harbor, and passing around to the western shore of Connanicut, and in by the south and out by the north entrance of Dutch Island harbor. The surveys of this bay have developed the fact that sticky bottom for anchorage occurs generally in water too deep for convenient anchorage,

except in the coves, and that deep indentations of the shore lines or coves are few in number, and such as are found are small in extent. The advantages of Narragansett Bay for a navy yard are an adequate depth of water, but with the drawback just stated; that it is easy of ingress and egress (the practicability of easy ingress with a northwest wind is now of little consequence since steam is of such common use), is not easily blockaded, is moderately free from ice, presents full space on its islands for the erection of buildings, docks, and basins, with extensive water front; presents good foundations for the accessories of a yard, has a moderate range of tides, and is but little exposed to freshets or overflows in any properly selected site, and is proverbial for the excellent health of the vicinity.

The disadvantages are, the entrance is often difficult from fogs; that its defence will involve most costly and difficult works of permanent fortification and of local floating batteries, or the closing of one of the two entrances now open by a dyke (similar to that which closes the third entrance at the north), and defensive works and floating batteries for the main entrance; that each available site must, as a rule, depend also upon itself for defence; that the population does not furnish enough troops readily transferred to the points of attack, and the best sites are so near the entrance of the bay as to be easily attacked, and all are upon islands; that the bay is swept by powerful winds from the NW., SW., NE., and sometimes from the SE., which raise a chopping sea, and is in some places exposed to; is defective in holding-ground, on account of the bottom being generally rocky, where the depth is less than twelve and more than four fathoms. The rocky nature of the excavation of the sites makes foundations expensive, the facility for obtaining iron and coal is small, and supplies generally require to be brought from a distance; a scant supply of fresh water generally; moderate facilities for procuring workmen, who must be domiciled on the site; all the bad effects of salt water upon wood and iron.

Advantageous thus as it is in some respects, we consider that, balancing the advantages and disadvantages, this bay would be an indifferent one for the location of a navy yard.

The board having decided that Narragansett Bay is an indifferent one for the location of a navy yard, the solution of the question submitted is reduced to a comparison between the advantages possessed by New London and League Island.

The list of materials collected in reference to New London will be found in Appendix No. 2; those collected in reference to League Island in Appendix No. 3.

The board, at an early period of its labors, adopted a series of points for particular examination, as containing the principal requisites for the site of a navy yard and naval depot. A com-

parison between New London and League Island has been made with reference to these points, as follows:—

First. "*Adequate depth of water at and near the site for vessels of the largest class.*"

In this respect the board regards the two sites as equal; either of them have a sufficient depth of water at and near for the accommodation of any vessels of our navy.

Second. "*Facility of ingress and egress.*"

The harbor of New London has a fine, clear entrance from the ocean, accessible at all times and all seasons; from it vessels of any class can proceed to sea with almost any wind, and be clear of the land in a few hours, the distance from the entrance of the harbor to the ocean being only about twenty-five miles.

League Island is situated at the distance of about one hundred miles from the sea, on a river, the navigation of which is often tedious and difficult for vessels of large class, especially in winter when obstructed by ice. The board is of the opinion that, with regard to this qualification, the harbor of New London is far superior to League Island.

Third. "*Security from attack by an enemy, and facility and economy of defences. To be easily defended from its own topographical advantages. To be readily re-enforced by troops from a dense population, within easy marching distance. Not easily blockaded. Not too near the mouth of a bay or river.*"

The present defences of the harbor of New London are Forts Trumbull and Griswold, the first a strong fortress, built of granite in the most substantial manner, and the second an extensive earthwork on Groton heights, opposite the city of New London. From the entrance of the harbor from Long Island sound to the site deemed most suitable for a navy yard, there are on either side of the river numerous points upon which iron towers or turrets, armed with guns of the largest calibre, can be erected at moderate cost, and so arranged as to render the entrance of hostile ships impossible, if forts and towers can be constructed of sufficient strength to resist the attacks of ships of modern construction and armament. Brigadier General George W. Cullum, of the United States engineers, states, as his opinion, that "No harbor in the United States is more susceptible of defence against the entrance of a fleet than New London. Although the city of New London does not contain a large population to resist invasion, its railroad connections are such as to bring the cities of New York, Brooklyn, Boston, New Haven, Hartford, Springfield, Worcester, Providence, and many other populous cities, and towns within about four hours' time. Its roads connect with the

whole network of railroads traversing the New England States and New York, and by them and its water connections probably as large a military force could be concentrated at this point in a given time as at any other point on the Atlantic coast not in the immediate vicinity of the large and populous cities. Besides, in the present state of naval warfare, it is not to be supposed that any of our important naval stations or harbors will be left unprovided with powerful steam rams to effectually prevent the approach of transports or men-of-war with hostile troops designing to land upon our shores.

The remoteness of League Island from the sea renders it little liable to attack from the sea, if the river approaches were properly defended. This, however, will require heavy expenditures on account of the great length of the river to be defended. No possible doubt can exist as to the ability of the city of Philadelphia to furnish promptly any number of men that may be required for its defence.

The board is of the opinion that either of the sites under examination may be promptly and efficiently defended, and that upon this question they may be regarded as equal.

FOURTH. "*Security from violent winds at sea, and from ice, whether fast or moving.*"

The harbor of New London is well protected from violent winds and sea, and is not obstructed by ice. Vessels of any size may anchor there with perfect safety at all times.

The anchorage off League Island is not exposed to danger from violent wind or sea; but in severe winters the drift ice from the river above often renders the positions of vessels in the river insecure and dangerous. On this point the board is of the opinion that the advantages are decidedly with New London.

FIFTH. "*Ample accommodations for safe anchorage, with good holding-ground in the adjacent waters.*"

The waters adjacent the harbor of New London are Fisher's Island Sound and Gardner's Bay, spacious roadsteads having abundant depth of water for the largest vessels, with the best holding-ground, and ample space to accommodate any number of vessels that the government may desire to concentrate there. This sound and bay are protected on nearly all sides, and in them merchant ships often ride out the severest gales in safety, under the shelter of the highlands of Fisher's Island, the Connecticut shore, and Long Island.

The waters adjacent League Island are the Delaware river and bay. These have ample space, sufficient depth of water, and good holding-ground, and furnish an abundance of safe anchorage, with the exception that vessels anchored in these waters

during severe winters are exposed to injury from the drifting ice. The board is of opinion that, upon this point, the harbor of New London is most advantageous.

SIXTH. "*Abundant space for the erection of all buildings, docks, and basins that may be required for a first-class establishment, with extensive water front for the accommodation of a large number of vessels.*"

Each of the sites under consideration affords ample space for the accommodation of all the various structures which may be required at a first-class naval establishment, with a line of water front sufficient for all the wants of such an establishment.

We are informed by very respectable persons in New London that one hundred acres of land can be purchased for from $50,000 to $75,000, and two hundred acres for $100,000. They are, therefore, regarded as equal upon this point.

SEVENTH. "*Adaptation of the site to the construction of permanent stone dry docks, wet basins, piers, wharves, rolling mills, forge shops, furnaces, and other heavy works.*"

The site at Winthrop's Point is well adapted to the construction of docks and all the various buildings required at a navy yard. The cove above the point is admirably suited for the construction of docks and basins. Such works, located in that position, would require but little excavation, and it is believed that secure foundations could be found without resorting to the tedious and expensive process of piling. The soil is gravel and stone, which afford the best and most substantial foundations for most of the buildings required at a navy yard. League Island is a reclaimed marsh, and the borings made by the board show that there is a depth of mud and fine sand varying from twenty-five to fifty-six feet in depth, under which is found gravel of good quality, and in sufficient quantities to sustain piles. It is undoubtedly true that no heavy structure can be erected on this island with any probability of safety without resorting to the expensive operation of piling.

The board is therefore of opinion that, in this particular, New London is vastly superior to League Island.

EIGHTH. "*Topography of the site, whether high, requiring excavation and grading, or low, requiring filling. If the first, what is the character of the excavation; and if the second, where are the sources from which the materials can be obtained.*"

The island at Winthrop's Point, in the harbor of New London, is at a moderate elevation above the level which would be assumed as a proper height for the surface of a navy yard, above ordinary high water, and would require grading. The

excavations for the Norwich railroad, in the rear of this point, shows that it is free of ledge, and is a gravel of excellent quality, and easy to be removed. This bank can be graded at a very moderate cost, and will furnish the best of material for filling low places, and extending the surface of the yard over such portions of the cove above as may not be required for occupation by docks and basins, thus accomplishing two objects at the same time. Other portions of the site will furnish abundance of stone of excellent quality for the construction of rough walls and foundations for the various buildings.

League Island is a reclaimed marsh, surrounded by a dry stone wall and embankment of earth, raised to exclude the river. A portion of the island was reclaimed many years since, and is known as the old meadow; we have no positive information on this point, but presume that at the time the wall and embankment were built all the land worth reclaiming was embraced within the enclosure; subsequently, and about eighteen years since, as we are informed, the enclosure was extended so as to embrace an additional area, now known as the new meadow. According to a plan which has been submitted to the board by a committee from the Board of Trade, this old meadow contains 219 acres, and the new meadow 155 acres.[5] On the north of the island, and between it and the main, there is a channel which, we are told, was of sufficient depth in former days to float large ships-of-war; now it is a narrow and shallow channel, not sufficient to float vessels of any size used by the navy. 'Large areas of marshes have formed on the east and west ends and on the north side of the island, and the whole appearance indicates a constant and rapid accumulation from the immense deposits of the Delaware river. To raise the surface of this island to a height which would render it safe from the encroachment of high tides will require a filling of from nine to ten feet over the whole area; and if, as has been suggested, a line of wharf front be carried out to the 23 feet line, it will involve an additional filling of a space one mile long, and averaging 481 feet wide and 19 feet deep. If this space is not filled, then the constant use of dredging machines will be required to maintain a sufficient depth of water to accommodate the vessels of the navy. To furnish the materials for this immense filling, which will amount in the aggregate to several millions of cubic yards, it is said that an abundant supply can be had from Red Bank, on the opposite side of the river, and from the gravel banks near the gas-works. There is probably an abundance of good material on the shores of New Jersey, but it must be purchased from the proprietors, and transported across the river—a process which, in the opinion of the board, will involve an expenditure of at least one million of dollars. Other sources of supply have been suggested, such as ashes from the

city, cinders, ashes, slag, &c., from the furnaces, but we regard these sources as uncertain, and the quantity limited, considering the immense quantity required to accomplish the object. The board is of the opinion that upon this point the advantages are vastly in favor of New London.

NINTH. "*Mean range of the tides and exposure of the site to freshets and overflows.*"

The range of the tide at New London is 2.5 feet, and at League Island 5.7 feet. When properly filled and graded, neither site would be liable to suffer from freshets and overflows. On this point New London has the advantage, there being less than one-half the range of tide.

TENTH. "*Set of currents about the site, and their effects.*"

The currents at New London are not rapid, the water is clear, and there is nothing to be apprehended from deposits at this place after the lines of wharves have been established and the wharves constructed.

At League Island the currents are more rapid; the water of the Delaware is dirty, holding a large quantity of earthy matter in solution, which is deposited in various points along the river, as shown by the immense accumulation which has taken place within a few years at League Island, and which is still in progress.

This current is thrown against the shore of New Jersey, opposite the horse-shoe, and is thence deflected towards League Island, as is clearly shown by the horizontal curves on the Coast Survey charts. Thus, during severe winters, upon the breaking up of the ice on the horseshoe, where all admit that it accumulates, it must be thrown with great violence towards League Island, to the great detriment and danger of all vessels lying in the vicinity. The board is of the opinion that upon this point the harbor of New London has greatly the advantage.

ELEVENTH. "*The facilities for procuring most rapidly supplies, stores of all kinds, and materials, especially iron and coal; easy communication by water, by railroads, and by good common roads, with a country not likely to be occupied by an enemy, so as to furnish naval stores and other supplies in time of war.*"

The facilities for obtaining all the materials, supplies, and stores necessary for a navy yard, except iron, coal, and the timbers grown in the south, are abundant at New London.

In addition to the means of transportation by water to a harbor always accessible, the railroad communications connect with the great lines which traverse the eastern, northern, and western States, and render the productions of those States available with

ease and certainty, and these northern and eastern States are the points where the largest portion of our merchant marine is constructed.

The Salisbury, Ulster, Adirondack, and other mines in the vicinity, though at present worked to a limited extent, furnish iron of a very superior quality, and it is believed they would, with proper extension of their mining operations, be competent to supply all the iron required for a navy yard.

For a building material this vicinity abounds in the finest granite, which can be furnished at the site at moderate cost, and an abundant supply can be had for the construction of docks, walls, and foundations.

In the article of coal New London would be deficient, as it must necessarily be transported from other points at an increased cost.

League Island possesses great facilities for procuring all the materials and stores required for a navy yard except the timbers grown at the south, and that for light spars grown at the north. The canal and railroad communications throughout the State of Pennsylvania and their connections with other States are not surpassed in extent or efficiency. The supply of iron and coal from the mines of Pennsylvania is immense, and no doubt can exist as to the certainty of a supply of those articles at League Island at a cheaper rate than at any other point. The board is of the opinion that, for a supply of iron and coal, League Island possesses the advantage over New London, but for other supplies that they are on an equality.

TWELFTH. "*Abundant supply of good fresh water, both for all yard purposes and for the shipping.*"

At New London an abundant supply of the softest and purest water can be obtained. At a distance of about one mile of the site, at Winthrop's Point, there is a stream of pure, fresh water, from which an ample supply to meet all the wants of the service can be had at an elevation of near one hundred feet above tide-water.

The supply of fresh water at League Island is unquestionable, and on this point the board is of the opinion that the two places are equal.

THIRTEENTH. "*The facilities for procuring workmen of all classes.*"

No reasonable doubt can exist as to the practicability of procuring at New London all the mechanics and workmen of every description which may be necessary to execute the work in a navy yard; for, although the city of New London does not at

this time contain a large population of this kind, the numerous cities, towns, and villages of New England and New York abound in artisans of all descriptions who are ever ready to respond to demands for their services. These people always concentrate where employment is to be obtained, and there would be great inducements for them to resort to New London, where house rents are remarkably low. Tenements can be had in the immediate vicinity, and the cost of living is moderate.

League Island is situated near a city celebrated for its manufactures and the excellence of her workmen. Persons working in a yard upon League Island would be compelled to reside at a distance from their work, there being no houses in the vicinity or sites suitable for the erection of habitations. They would, therefore, be subjected to the inconvenience of a long walk, or the expense of riding to and from their work.

Without doubt any number of workmen of all classes can be had at this place, notwithstanding the inconvenience to them.

The board is of the opinion that upon this point the two places may be considered equal.

FOURTEENTH. "*Quality of the water near the site, whether fresh or salt, and the probable effects of the same upon the bottoms of iron vessels when laid up for a length of time.*"

The water of New London is salt, which is undoubtedly injurious to the bottoms of iron vessels; fresh water for laying up such vessels, when not wanted for active service, can be found a few miles higher up the river. Still this separation of the vessels from the immediate supervision of the officers of the yard would be inconvenient, and attended with additional cost in the necessary precautions for their protection and safe-keeping. This objection could be obviated by providing means for taking such vessels out of the water when not required for immediate service.

At League Island the water is fresh, and in this respect the board is of the opinion that the advantage is with League Island, so far as iron vessels are concerned.

FIFTEENTH. "*Health of the vicinity.*"

No question can be raised as to the superior excellence of the health enjoyed by the residents of New London. League Island is situated on a fresh-water river, nearly surrounded by marshes covered with vegetable matter and exposed to the sun at every low tide during the day; and although we are told that it is as healthy as other places in the vicinity, we cannot believe that League island can be regarded as a healthy place. The board is of the opinion that on this point New London is vastly superior.

From the foregoing comparison it will appear that for an

advantage depth of water at and near the site for vessels of the largest class; for security from attack by an enemy, and facility and economy of defence, to be easily defended from its own topographical advantages, to be readily reinforced by troops from a dense population within easy marching distance; not easily blockaded, not too near the mouth of a bay or river; for abundant space for the erection of all buildings, docks, and basins that may be required for a first-class establishment, with extensive water front for the accommodation of a large number of vessels; for facilities for procuring most rapidly supplies, stores of all kinds, and materials, except iron and coal; easy communication by water, by railroads, and by good common roads, with a country not likely to be occupied by an enemy, so as to furnish naval stores and other supplies in time of war; for an abundant supply of good, fresh water, both for all yard purposes and for the shipping, and for the facilities for procuring workmen of all classes, the board is of the opinion that while League Island possesses some of the requirements to a greater extent than New London, still, either of the two points possess these qualities to an extent amply sufficient to meet all the demands of the service, and that on these points, for all practical uses of a navy yard and naval depot, they may be regarded as equal. That for facility of ingress and egress; for security from violent winds and sea, and from ice, whether fast or moving; for ample accommodations for safe anchorage, with good holding-ground in the adjacent waters; for the adaptation of the site to the construction of permanent stone dry docks, wet basins, piers, wharves, rolling mills, forge shops, furnaces, and other heavy works; for the topography of the site, whether high, requiring excavation and grading, or low, requiring filling—if the first, what is the character of the excavation, and, if the second, where are the sources from which the material can be obtained; for the mean range of the tides and exposure to freshets and overflows; for the set of the currents about the site and their effects, and for the health of the vicinity, the board is of the opinion that New London harbor is superior to League Island. That for the supply of iron and coal, and the quality of the water, whether fresh or salt, and the probable effects of the same upon the bottoms of iron vessels when laid up for a length of time, the board is of the opinion that League Island possesses advantages over the harbor of New London.

The Board is aware of the importance of the advantages which League Island possesses over the harbor of New London in the immense supplies of iron and coal, which can, without question, be delivered at that point at cheaper rates than at any other site examined, and also of the fact that the fresh water of the Delaware River would be very advantageous to the bottoms of iron

vessels. Still, in view of the very great expense that must necessarily be incurred in filling up this island before it can be of practical use for a navy yard, the probability that a large annual appropriation will be required for maintaining a sufficient depth of water at the island by dredging, the great cost of pile foundations for every structure required in the yard, the danger from drift ice, and in view of the many advantages possessed by the harbor of New London over League Island, the board, after a very careful examination of all the points under consideration and mature deliberation, is of the opinion that the advantages of a more abundant supply of coal and iron at League Island, and at cheaper rates, together with the advantages of fresh water, are more than balanced by the superior advantages possessed by New London in other respects; and therefore—

Resolved, That, in the opinion of the board, the public interests will not be promoted by acquiring the title to League Island for naval purposes.

Resolved, That the harbor of New London possesses greater advantages for a navy yard and naval depot than any other location examined by this board.

S. H. STRINGHAM, *Presiding Officer.*
W. H. GARDNER, *Commodore.*
G. J. VAN BRUNT, *Commodore.*
W. P. S. SANGER, *Engineer.*

Hon. Gideon Welles,
Secretary of the Navy.

MINORITY REPORT.

PHILADELPHIA NAVY YARD, *October* 24, 1862.

SIR: In your report of July 4, 1861, submitted with the President's message to Congress, you presented to that body and the country the matter of iron-clad steamers for naval purposes, and an appropriation was made by Congress to build "one or more armored or iron-clad or steel-clad ships or floating batteries."

In your letter of March 25, 1862, to the Naval Committees of Congress, you state among the general conclusions to which you have arrived, the following:—

First. Steam has become such an indispensable element in naval warfare that naval vessels, propelled by sails only, are considered useless for war purposes. The last sailing vessel built for the navy was the Constellation, commenced in 1853, and completed in August, 1855.

Secondly. Steam vessels of-war, unless protected from the enemy's shot and shell, can make but feeble resistance to, and must surrender when assailed by, an iron-clad vessel.

Thirdly. The navy, as it exists at present, cannot successfully contend against a power employing iron-clad vessels, and, consequently, cannot meet the requirements of the country.

Fourthly. I deem it imperative that we should forthwith commence the construction of armored vessels on a scale commensurate with the great interests at stake.

* * * * * * * * * * * *

Ninthly. I ask the Committee to consider the important subject of producing iron plates for the armature of vessels. It is

believed there are but few, if any, mills in the country capable of rolling plates over two inches in thickness, and cannot be produced in very large quantities. The demands of the government will be likely to raise the price of these plates so as to render the vessels more expensive than under ordinary circumstances would be the case. Under these circumstances, shall the government, under proper restrictions, advance money to some well-known establishment to enable the proprietors to put up the necessary buildings and machinery? Shall one of the navy yards be selected in which to erect the works called for under the change in naval armaments, or shall a new point be selected and the foundation laid for an establishment meeting all the requirements of an iron navy? Forging for heavy shafting is also requisite, and some measures in regard to such an establishment seem indispensable in connection with the other plans suggested. * *

Again, on the 9th of June, 1862, you called the attention of the naval committees of Congress to the entire subject, and to the necessity for establishing a yard adapted to the radical changes introduced into the naval architecture, where the materials of which naval vessels are constructed shall be wrought, and the iron plating for armature might be manufactured, or, as expressed in one of the letters, "the foundation be laid for an establishment meeting all the requirements of an iron navy."

The views and suggestions in these letters led to the tender of League Island to the government, by the city of Philadelphia, for the purposes specified. Congress, in acting upon the subject, passed the following act:—

AN ACT to authorize the Secretary of the Navy to accept the title to League Island, in the Delaware River, for naval purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Secretary of the Navy be, and he is hereby, authorized to receive and accept from

the city authorities of the city of Philadelphia the title to League Island, in the Delaware River, together with the marsh east of and adjacent thereto, within the first ward of the said city of Philadelphia, together with all riparian rights and privileges thereunto belonging and appertaining, to be used for naval purposes by the government of the United States: *Provided*, That said title shall not be accepted and received unless the same shall be perfect and indefeasible to the whole island and marsh adjacent to low-water mark; nor if, upon more thorough examination and survey of the premises by a competent board of officers to be by him appointed, he shall discover that the public interests will not be promoted by acquiring the title as aforesaid.

SEC. 2. *And be it further enacted*, That the board of officers to be appointed by the Secretary of the Navy, according to the provisions of the first section of this act, shall, before proceeding to any decision of the questions hereinbefore referred to them, make a survey and examination of the harbor of New London, Connecticut, and its surroundings, with reference to its capacity and fitness for a naval depot and navy yard; and whether the public interests will not be promoted by establishing a naval depot and navy yard in or near said harbor of New London instead of League Island; and that they also make the same investigation in regard to the waters of Narraganset Bay.

Approved July 15, 1862.

Under this act you appointed the following board of officers, viz:

Rear Admiral S. H. Stringham, presiding officer; Commodore William H. Gardner, Commodore G. J. Van Brunt, Captain John Marston, Professor A. D. Bache, Civil Engineer W. P. S. Sanger; directing them to meet in New London on the 26th of August, 1862, and giving instructions in a letter dated August 12, 1862. (Appendix A.)

At their first meeting a paper was presented by one of the

members, Mr. Sanger, which was, after a few additions by Professor Bache, adopted by the board as containing "the points requiring careful consideration in determining the proper location for a complete naval establishment."

These were as follows:—

1. Adequate depth of water at and near the site for vessels of the largest class.

2. Facility of ingress and egress.

3. Security from attack by an enemy, and facility and economy of defence. To be easily defended from its own topographical advantages. To be easily re-enforced by troops from a dense population within easy marching distance. Not easily blockaded. Not too near the mouth of a bay or river.

4. Security from violent winds and sea, and from ice, whether fast or moving.

5. Ample accommodations for safe anchorage, with good holding-ground, in the adjacent waters.

6. Abundant space for the erection of all buildings, docks, and basins that may be required for a first-class establishment, with extensive water front for the accommodation of a large number of vessels.

7. Adaptation of the site to the construction of permanent stone dry docks, wet basins, piers, wharves, building and launching slips, foundries, rolling mills, forge shops, furnaces, and other heavy works.

8. Topography of the site, whether high, requiring excavation and grading, or low, requiring filling. If the first, what is the character of the excavation? and if the second, where are the sources from which the material can be obtained?

9. Mean range of the tides, and exposure of the site to freshets and overflows.

10. Set of the currents about the site, and their effects.

11. The facilities for procuring most rapidly supplies, stores of

all kinds, and materials, especially iron and coal. Easy communication by water, by railroads, and by good common roads, with a country not likely to be occupied by an enemy, so as to furnish naval stores and other supplies in time of war.

12. Abundant supply of good fresh water, both for all yard purposes and for the shipping.

13. The facilities for procuring workmen of all classes.

14. Quality of the water near the site, whether fresh or salt, and the probable effects of the same upon the bottoms of iron vessels when laid up for a length of time.

15. Health of the vicinity.

The board proceeded to examine the harbor of New London and the surroundings, then adjourned to Bristol, Rhode Island, for examination of Narraganset Bay, and then to Philadelphia for the investigation of League Island and the adjacent waters of the Delaware River.

They collected much information from authentic sources in regard to the various questions, and place in the Appendixes Nos. 1, 2, 3, the maps, charts, diagrams, notes, descriptions, pamphlets, replies to queries, and other miscellaneous information obtained in regard to each of the places of which their instructions required an examination. These we respectfully request may be placed in the archives of the Navy Department, so that access to them may be had under proper restrictions, and copies may be furnished to those who desire it. Thus secured from loss, they will remain for consultation by the department or other duly authorized persons. We trust they will prove that we have not been sparing in availing ourselves of our opportunities to acquire the information needed for the delicate determination in regard to which we have been called upon by the department to report.

In collecting this information the board acknowledge their obligations to the committee of citizens and of the authorities of New London, and the committees of the Board of Trade, of the Corn Exchange, and others, at Philadelphia.

They gratefully acknowledge the kindness shown them by the senators from Connecticut, the governor of the State, and many other prominent citizens, as also by the governor of the State of Rhode Island, and other State and government authorities, and by many of the citizens of Philadelphia.

On the 1st of October a resolution was adopted by the board, asking from the honorable Secretary of the Navy instructions as to whether the board are to select the site for an ordinary navy yard, or of a first-class establishment for iron-clad or for iron vessels with all the accessories.

To this a reply was received, (Appendix B,) declining to give further instructions, referring to the law of Congress previously sent, and to the letters of March 25 and June 9, 1862, to the naval committee of Congress.

With this letter before them the board proceeded to determine the scope of their duties, and affirmed it in the following resolution by a vote of five to one:—

Resolved, That after giving full consideration to the objects for which they were appointed, as indicated by the law, and inviting instructions from the department, considering the views of the department as expressed in the letters of the Secretary of the Navy of March 25 and June 9, 1862, and the discussions by the honorable Mr. Grimes, of the United States Senate, and others in Congress, the wants of the navy and the country, and the circumstances of the times connected with the progress in naval warfare, the committee are of opinion that their duty requires them to refer, in selecting a site for a navy yard, to a first-class establishment for iron-clads and iron vessels, or to a site for laying the foundation of an establishment meeting all the requirements of an iron navy.

On the 18th of October the board adopted, by a vote of four to two, the conclusions of a report made by Commodore Van Brunt and Professor Bache of relative measurements of area of

deep water off the sites at New London and League Island, showing the relative areas to be three to one in favor of League Island, and the distance of twenty-three feet depth from mean low-water line to be two and a half times less at League Island than at New London.

The examination of the several points named having been completed, the Coast Survey results being used for comparisons in the surveys, the board proceeded to discuss the relative merits of the localities.

The following resolution was adopted in reference to Narraganset Bay, without dissent:—

Resolved, That the report on Narraganset Bay, submitted by the committee on the 25th September, and concurred in by the board, be adopted.—(Appendix C.)

The discussion of the relative merits of New London and League Island resulted in a conflict of opinion, which, dividing the board, gave rise to majority and minority reports.

The undersigned beg leave to present to you, on behalf of the minority, the reasons which induce them to recommend to you the acceptance of League Island as a site for a navy yard, and to present such facts as we think will satisfy you, or, in the language of the law, "enable you to discover," that the public interests will be promoted by acquiring the title to League Island, supposing it, as we do, to be perfect and indefeasible to the whole island and marsh to low-water mark.

In presenting our views we shall follow the form before referred to as adopted by the board at the early part of their meeting, and used in its discussions of the relative advantages of the several localities. This will enable you to weigh most readily the facts and arguments of the majority and minority, since the subjects of discussion follow in the same order.

We differ from our colleagues, with great respect, but as the matter is one of reason, and not of feeling, we are constrained,

thus differing, to present the case for your decision, as contemplated in the law. The difference, in our view, is not a slight, but a most important one, or we should not have troubled you with it, but have yielded to the majority of voices.

We consider League Island not only to have very great advantages, but to be the place for a navy yard for iron-clads and iron steam vessels, presenting a large economy in annual outlay for coal, iron, timber, and other materials; the great advantage of fresh water, essential for iron vessels; most important advantages in regard to defence, in regard to procuring workmen, and in regard to construction, etc.

Referring to the order of subjects already stated, we proceed to discuss them in turn:—

1. *Adequate depth of water at and near the site for vessels of the largest class.*

There is adequate depth of water at and near the site for vessels of the largest class, at both League Island, near Philadelphia, and Winthrop's Point, near New London.

2. *Facility of ingress and egress.*

There is entire facility of ingress and egress.—(See Appendix D, of list of vessels, etc.) The difference in *time* taken for ingress and egress is in favor of New London, which is nearer the sea.

While we admit that, for sailing vessels, the distance of League Island from the sea is a disadvantage, this disappears, when towage by steam is universally used, reducing itself to a mere addition of a few hours of time. So for steam vessels, and this position is preferred for a steam-vessel yard. The advantage of defence would vastly more than compensate in any case, especially in these days, when iron-clad vessels may run into harbors near the ocean and lay cities under contribution. "With iron-clads, a harbor easy of access is the last to be desired for a great yard."

3. *Security from an attack by an enemy, and facility and economy of defence. To be easily defended, from its own topographical advantages. To be easily re-enforced by troops, from a dense population within easy marching distance. Not easily blockaded. Not too near the mouth of a bay or river.*

In security from an attack by an enemy, and facility and economy of defence, League Island, which is seventy miles from the mouth of one of the most defensible rivers of the United States, is greatly superior as a site for a navy yard to Winthrop's Point, which is three and one-eighth miles from the mouth of the Thames River. League Island is secure from a naval attack by rifle projectiles; Winthrop's Point is not. The permanent defences of Philadelphia defend League Island, and with obstructions in the channel, defended by temporary or permanent works, and iron-clads above them, the river is amply secure. The defences required by the site itself are almost nothing. Neither of these remarks applies to the Thames River. The present works on the Thames would be insufficient for defence of a naval depot from even a water attack, and expensive works would be required to defend the station from a land attack, either from the east and north or from the south and west. League Island is easily defended by its own topographical advantages, being separated from the main by an arm of the river, which requires bridging or a causeway, and is therefore defensible. League Island has greatly the advantage in regard to defence by troops, from a dense population within easy marching distance. The militia draft within twenty miles of Philadelphia is 142,932 men, while within twenty miles of New London it is but about 6,000 men. *League Island is nearer to New York than Winthrop's Point is.* The Thames River is as easily effectively blockaded as the Delaware; probably it will be more so when a fort shall have been erected at the breakwater. Winthrop's Point has been already stated to be near the mouth of the river Thames. Dutch Island harbor

was rejected on this, among other grounds, and is three and five-eighths miles from Narraganset entrance. The defences of the Delaware, except the fort at the breakwater and field-works, are finished; those for the Thames, to defend a navy yard site, are yet to be made. Fort Trumbull (a permanent work of a small class) and Fort Griswold (an earthwork) will not suffice for the defence of a first-class navy yard; on the contrary, very expensive permanent works must be added for this purpose. The position of a navy yard commanded by heights of some sixty to eighty feet, within distances of from half to two miles, is an unsafe one, and would be the case of a navy yard at Winthrop's Point, near New London. The filling of League Island over a space of one hundred acres, would reduce nineteen acres of Red Bank five-eighths to 1.4 mile distant to four feet above mean high water. Therefore it would not even be necessary to fortify Red Bank for the protection of the navy yard, though it might be expedient, from other considerations, to do so, at least by temporary works.

The expenditure necessary to render moderately secure the site of a navy yard near Winthrop's Point from a combined naval and land attack in front and on the flanks would be out of all proportion to the object to be gained, whereas that at League Island is rendered secure by the defences necessary for the city of Philadelphia, which are below it, nearer to the mouth of the river, as Fort Mifflin, Fort Delaware, and other less permanent works, in co-operation with which would be floating batteries and obstructions of the river, protected from removal by temporary or permanent works, and by floating batteries or iron-clad steamers.

4. *Security from violent winds and sea, and from ice, whether fast or moving.*

League Island has the advantage of Winthrop's Point in less exposure to violent winds and sea, and Winthrop's Point has the

advantage in less exposure to ice; though the first advantage is one of constant action, and the other one which takes effect once in forty years. The less width of the Thames at Winthrop's Point (only 1,060 yards, or two-tenths of a mile) is probably more than balanced by the water being salt.

By the meteorological registers kept at Philadelphia, it appears that a sufficiently cold winter to close the Delaware occurs but once in ten years, and that the river is closed but once in forty years.

When ice makes in the Delaware in extremely cold winters, it is deposited on the Horseshoe shoal, and, breaking up, passes in the direction of the currents to the New Jersey shore, and thence, in a gentle, undulating curve, to the lower end of League Island. The testimony of pilots shows that the breaking up of ice is never a serious matter on the shores of League Island. It is usually honeycombed and rotten before moving. The ice boat is, with rare exceptions of extremely cold winters, say once in forty years, able to keep the Delaware open; in ordinary winters its use is not required; and in the coldest on record in eighteen years it was able to make way through the ice on any day of the season, one of these years including the severest winter on record.

5. *Ample accommodations for safe anchorage, with good holding ground in the adjacent waters.*

The holding ground is good in both harbors.

A water front of a mile, which is more than adequate for the wants of a first-class establishment, and all its appurtenances, may be had at either place.

The area of anchorage for large vessels off Winthrop's Point, and for a mile above, is but one-third that off League Island, the latter having in this respect, thus, very great (threefold) advantage. (See report of committee before referred to.)

There is ample water both at League Island and New London for most of the vessels of the largest class of our navy. The Wabash, fully equipped and armed (drawing twenty-three feet), has come up the Delaware to the present navy yard, above League Island, and has gone to sea thence.

The table of arrivals and departures shows that this is the case with some of the largest class men-of-war of our navy.—(Appendix D.)

6. *Abundant space for the erection of all buildings, docks, and basins that may be required for a first-class establishment, with extensive water front for the accommodation of a large number of vessels.*

The space upon the old League Island is some two hundred and sixty acres; upon the old and new, four hundred and ten acres; space which may be added in by additional embankment, about six hundred acres. Along one mile of front the island has an area of, say, one hundred and ninety acres. The space to the railroad back of Winthrop's Point is but sixty acres, and to turn the railroad from its present position will be costly. The farming land, however, for the purpose of additional space in the yard, can be had at a probably moderate cost if the railroad be allowed to pass the yard.

One hundred and fifty acres is the least quantity of land needed for such an establishment as we suppose to be contemplated by the department. League Island affords a fine area for the convenient disposal of buildings and other accessories of the establishment. Neither the excavation nor embankment required will be comparatively expensive, while they assist each other. At Winthrop's Point a hill is to be cut down or to be ascended.

7. *Adaptation of the site to the construction of permanent stone dry docks, wet basins, piers, wharves, rolling mills, forge shops, and other heavy works.*

Either site is adapted to the construction of permanent stone

docks, wet basins, piers, wharves, rolling mills, forge shops, furnaces, and other heavy works.

The foundations of heavy works at League Island must be piled; those at Winthrop's Point be cut from a high gravel hill, forty, sixty, or one hundred feet high, according to distance, with a hard gravel, or a rocky basis. At the back of League Island is an arm of the river of two hundred feet in width, in the average, and which not only contributes to the defence of the navy yard site, but will serve for the provision of wharves for small docks, for depots of timber and other materials, giving thus a large additional front if needed. This passage may be readily defended if it is desirable to deepen it.

League Island has all the advantages of an insular situation from this passage, without the disadvantages to which an island at a considerable distance from the main is exposed.

While marshes have formed below the island, the channel ways have deepened, and the improvements proposed to be made at League Island, if conforming to correct principles of hydraulic engineering, will still further increase the depth of the river channels.

League Island will probably be filled up in part, ample materials for which are found in the gravel of Red Bank, or of the main near the gas-works, or in the refuse of the city foundries and iron works, and for the removal of which the owners of these establishments now pay, which can be brought by water to the island; and, above all, the ashes, slag, and other products of the forges, foundries, and furnaces, which also would be an expense to remove, and which will in time afford materials for the extension of the island over the present flats.

Works producing 120 to 150 tons of iron per day furnish a vast amount of slag and other matters which accumulate in immense piles, as we have seen at the iron works on the Schuylkill and Lehigh.

Winthrop's Point must be cut down through hard diluvial gravel, and, probably, in part through rock. Should hard pan be met, it will be even more difficult to remove than rocks.

The subsoil of League Island is favorable for the driving of piles, a bed of diluvial gravel underlying the "alluvial clay," at depths, on the average, of thirty-seven feet. In one spot, upon the old island, the borings of the commission reached gravel at twenty-five feet, and were carried on seven feet further with difficulty, reaching a stony bed at that depth. In the softest boring on the new part of the island the gravel was reached at fifty-six feet. These are all admissible depths for piling.

The slag, ashes, and other refuse matters of furnaces and forges, which are now carried away from establishments near the wharves of the city of Philadelphia, could be transported by water cheaply to League Island, if needed for filling in. We have ascertained that four private establishments at Philadelphia, with rolling and puddling furnaces, produce some 415 cubic yards of wastage per week.

8. *Topography of the site, whether high, requiring excavation and grading, or low, requiring filling. If the first, what is the character of the excavation? and if the second, where are the sources from which the materials can be obtained?*

The surface of League Island is, on the average, 3.6 feet above mean low water, and 2.4 feet below mean high water. The old part of the island is higher than that which was enclosed in 1843 and 1844. The whole is surrounded by an earthen embankment, protected on the exterior all around, or nearly so, by a dry stone wall. The whole island is used for farming purposes. It has, as is usual with grass meadows in that vicinity, ditches communicating with the river by sluices.

The surface is perfectly dry, except in the ditches and a few irregular spots. The earth taken from within nine feet of the

surface, after passing through the vegetable mould, is an "alluvial clay," or sand, mixed with a small proportion of clay, and varying in stiffness. It is tenacious, and will form, when excavated for docks and basins, a good material for filling in to raise the adjacent levels.

To reach the depth of twenty-three feet of water for a stone wall, or pier, against which large class vessels may lie, or to reach that depth by piers, wharves, quays, and joining walls, or to reach the depth required by an anchorage for large vessels, requires but half to one-third of the distance, on the average, at League Island, required at the site near Winthrop's Point, which is greatly to the advantage (two and a half to one) in favor of League Island. The site near Winthrop's Point rises abruptly from the water to a hill forty, sixty, or one hundred feet in height, according to the limits which may be set to the yard. The hills are of diluvial gravel (hard), covering, at greater or less depth, rocky ledges. The excavation will be difficult, and if rock is met by the piles on the mud flats where it is proposed to place structures, or in the excavations inside of the shore-line, the work must be very expensive. This is likely to be the case, as, at a mile from the point northward, a rocky ledge of about $55\frac{1}{2}$ yards by 139 yards shows itself. Considering the usual modes of construction in existing navy yards, the commission considers that probabilities in reference to cost are in favor of the foundations at League Island. At no navy yard but Portsmouth and Boston (in part) are heavy structures placed upon other than a pile foundation.

The relative expense of filling up at League Island, or cutting down at Winthrop's Point, can only be estimated when the plans of navy yards shall have been prepared and accepted for the two places; but it may be affirmed in regard to League Island that the amount of filling up may be regulated at pleasure—the dry docks, wet basins, and the like, requiring excavation, and other structures requiring filling.

We have the assurance of a machinist of much experience that it is better to place steam-hammers and other percussive machinery upon an elastic basis, as upon piles, than upon a comparatively inelastic one, like rock.

Should a quay wall be built in front of League Island navy yard, front on the line of twenty-three feet water, it will by no means be necessary to fill in behind it, as the space will be occupied chiefly by docks. Such speculations, in the absence of plans for a yard, are, however, premature.

A fine opportunity for applying the new form of dock building with concrete will be thus furnished. The dock is made of concrete, built by the aid of a coffer dam in the water, and is a dam or box of a single stone of concrete, which, properly protected at certain points by wood or iron built with it, is almost as durable as stone.

9. *Mean range of the tides and exposure of the site to freshets and overflows.*

The mean range of the tides at the two places is about 5.7 feet at League Island, and 2.5 feet at New London; in neither site inconvenient for purposes of construction or use.

The six feet rise of tide at Philadelphia is an advantage over the two and a half feet at New London to navigation and for navy yard uses, as far as it makes any difference at the two points.

Neither site is much exposed to freshets or overflows from the rise of waters in the rivers.

10. *Set of the currents about the site and their effects.*

At League Island the currents are set off by Greenwich Point above water, and the Horseshoe shoal below, to the New Jersey shore, returning in gently sweeping curves towards the south end of the island, where they make a deposit below the point

fixed upon by us as the southern termination of the site for the navy yard.

Above Winthrop's Point the river Thames suddenly widens from a little over a quarter to a little over half a mile in width, and contracts again at Winthrop's Point to a little over three-sixteenths of a mile.

There is a deposit thus created in the cove, interrupted by a ledge of rock, which has seemed to us the natural limit of the water front of the proposed site. The currents pass into and out of this cove in a direction slightly inclined to the axis of the main stream, making the deposit before referred to.

At neither place are they particularly strong, and their peculiarities, if any, would require special observations to detect. The narrowing of the waterway at Winthrop's Point increases the velocity of the current just opposite to it.

11. *The facility for procuring most rapidly supplies, stores of all kinds, and materials, especially iron and coal; easy communication by water, by railroads, and by good common roads, with a country not likely to be occupied by an enemy, so as to furnish naval stores and other supplies in time of war.*

Limestone, suitable for the manufacture of iron, is found in great abundance within fifteen miles of League Island. One bed is sixty miles long by nine miles wide.

One of the first considerations in selecting a site for a first class establishment for iron-clads and iron vessels is, that it shall be near abundant supplies of American iron and coal, and League Island, from its nearness to the iron mines and iron furnaces of Pennsylvania, offers great advantages in time of peace, and still greater in time of war, on the score of ample, steady, and cheap supply over New London.

The prices current of the cities of New York and Philadelphia fully establish that iron and coal are cheaper in Philadelphia

than in New London, which must be the case from natural laws as to location, and the laws of trade as to the cost and supply. The same is the fact in regard to coal generally, and any other state of facts is not the rule, but the exception.

The quantity of iron manufactured in Pennsylvania is adequate for many first class establishments, being about 325,000 tons in 1860–'61, and increasing, or nearly ten times what a first class establishment would use. The whole of the Salisbury iron would barely furnish one such establishment, and it is needed for gun-barrels and fine machinery, and is too costly for ordinary work.

The price of iron and coal on the seaboard generally, as a rule, is its cost in Philadelphia, with the freight to the place added.

The supplies come from the interior, which is not likely to be occupied by a foreign enemy. The number of roads connecting Philadelphia with the interior is several times that connecting New London with the interior. It is not, however, likely that either connection would be permanently cut off during a foreign war.

There are abundant supplies of good timber for ordinary purposes of construction, and for most purposes of ship-building, within easy reach of League Island, in Pennsylvania, New Jersey, Delaware, upon the Delaware river and bay, and the Susquehanna and their tributaries, cheaply brought to market by water and by railroads with descending grades. With reference to live-oak, southern pine, and a few less important woods, Philadelphia and New London are upon the same footing. Philadelphia is a large exporting market for ship timber, in which respect it greatly exceeds New London.

The statements of the Board of Trade, in their replies to the questions of the commission in regard to supplies of timber, are confirmed by the constructor and master carpenter of the yard at Philadelphia, and by other ship-builders.

It appears from estimates by good authority that the quantities of timber and sawed stuff furnished by the region referred to by the Board of Trade to the eastern markets this year has not been less than 1,275,000 feet, board measure, for white oak, 3,450,000 for white pine, and 844,000 for yellow pine, of Pennsylvania, showing the great use made of this timber at the present time. The eheap expedients for seasoning timber in fresh-water navy yards render it unneeessary to resort to oeean salt water for seasoning.

The tar, piteh, and turpentine of the South, the flour of the West, the hemp of Kentucky, the provisions of Pennsylvania and the West, are to be had at priees generally lower and always as low as at any other point on the seaboard.

Materials similar to that of which the wall around League Island is eonstructed, may be had within seven to nine miles from the spot. Good foundation stone may be had at less than a mile from Winthrop's Point.

Granite is brought from Maine and Massachusetts as ballast to Philadelphia, in eoal vessels, much diminishing the freight. Winthrop's Cove is, however, mueh nearer the source of supply than League Island.

12. *Abundant supply of good fresh water, both for all yard purposes and for the shipping.*

The water of the Delaware is noted as being very good for the use of vessels; the supply is unlimited. The supply of water for navy yard purposes is easy.

At New London the supply must be brought from a distanee, and is not comparable in quantity with that from League Island.

The water from the eity works may be readily brought to League Island. In ease of a fire at the yard a very large supply of water is needed.

Spring water is more or less hard, and henee supplies of this

kind are inferior in quality to those of river water—an advantage at League Island.

13. *The facilities for procuring workmen of all classes.*

It would be difficult to find a place possessing greater advantages than Philadelphia for procuring workmen of all classes. The extension of the horse railroads to League Island, or the use of a steam-tug as now, will render it easy to live in the city and work at the yard. The government will thus, at League Island, not only not require to bring workmen from distant places to colonize, as would be necessary at Winthrop's Point, but has a large choice of the most skilful mechanics competing for employment.

It is important to have a large manufacturing community near, whence to supply workmen for government works in case of strikes.

On the extension of the city streets to the arm of the river, back of League Island, are good building lots, where houses for the workmen may be placed. Upon Broad Street, which is already so extended, are very good sites. The ferry, which formerly connected League Island with Red Bank, being re-established, there are admirable sites for dwellings within less than a mile of the navy yard, and a first class hotel building is already erected there. There are good sites on the island itself, with trees of already large growth near them.

14. *Quality of the water near the site, whether fresh or salt, and the probable effect of the same upon the bottoms of iron vessels when laid up for a length of time.*

The water is perfectly fresh at League Island at all periods of the tide, and under all its variations and those of the winds. The site is therefore vastly superior to that at Winthrop's Point, where the water is salt at all times, especially for iron vessels. The bottom of an iron vessel fouled by a sea voyage would be

cleaned and perhaps the grass be killed, by remaining at League Island anchorage. The fresh water at League Island has little or no effect upon the iron of a vessel, while the salt water of Winthrop's Point corrodes the material more or less rapidly even when coated, and the coating itself is an expensive operation.

The spray from salt water in storms is very injurious to machinery near the sea-shore, and to this the works at New London would be exposed, while those at League Island would not.

15. *Health of the vicinity.*

The residents of the vicinity consider League Island as healthy, and those whom we have met in our visits, men, women, and children, have a healthy appearance. There is probably not a healthier place in the United States than New London, or one where more comfort is to be found, and we should give it the preference as to health over League Island.

Believing that League Island is entirely healthy, we do not mean in this comparison to express any doubt whatever on that point.

The following points not noticed in these general questions, but which formed a part of our questions addressed to the authorities of New London and Philadelphia, commend themselves to the notice of the commission.

1. That in the present circumstances of naval warfare with iron clads and rifled guns of long range, a navy yard cannot be safely placed within four miles of an outside anchorage for large vessels, and that hence the location of such an establishment at Winthrop's Point, near New London, which is $3\frac{1}{8}$ to $4\frac{1}{8}$ miles from New London light, is inadmissible.

The observations of Lieutenant Commanding Phelps, United States navy, assistant in the Coast Survey, shows that the range of the rifled six-pounders (Alger's) of the Coast Survey steamer Corwin, with the Hotchkiss shell, are fully $4\frac{1}{2}$ miles.—(Appendix E.)

2. That the cutting down of Red Bank, the materials from which would be useful for filling part of League Island, would render the fortification of it unnecessary, if it were not called for by other considerations of defence.

3. That the cost of sixty acres at Winthrop's Point would be, according to the estimate of the very respectable committee of citizens, about $50,000 to $75,000, and of 200 acres, $100,000. League Island has been purchased by the city of Philadelphia, which guarantees the title and delivers possession without cost to the United States. This munificent gift cost the city $300,000.

The following is a brief summary of the points presented in the foregoing, taking up first those in which either place presents adequate facilities for a navy yard, and then those in which we consider League Island superior to New London :—

1. At both of the points presented in the foregoing statement, League Island, Philadelphia, and Winthrop's Point, New London, there is adequate depth of water.

2. There is at both entire facility of ingress and egress.

3. Winthrop's Point, New London, is more exposed to winds and sea than League Island, Philadelphia, and less exposed to ice. The action of wind and sea is frequent, while that of the ice is rare, the river being closed during the whole winter to below League Island but once in forty years on an average. The ice-boat suffices to keep it open in the hardest winters.

4. There is good holding ground in both harbors. Sufficient water-front may be had in both.

5. Either site is adapted to the construction of docks and other appurtenances of a navy yard.

Winthrop's Point must be cut down, and League Island possibly, (though not necessarily), in part raised. Firm gravel to sustain piles is found, as far as penetrated below League island, at a depth very convenient for piling.

It will require a study of the appurtenances required at each place to make a safe estimate of the cost at each.

The site at Winthrop's Point rises to piles of gravel or rock, 40, 60, or 100 feet, according to extent of front.

6. Neither site is much exposed to freshet.

7. Neither injuriously affected to any considerable extent by currents.

8. There are but two points, that of health and of exposure to ice, in which Winthrop's point has the advantage over League Island. This in regard to health, is more relative than absolute, for League Island is not an unhealthy place; and in yielding the palm to New London on that score, it is that that city is so extraordinarily healthy, and not that League Island is unhealthy. So in regard to ice; there is no danger from it at League Island.

The points in which, in our judgment, League Island, Philadelphia, has the advantage over Winthrop's Point, New London, are the following:—

1. Security from attack. The middle of a navy yard extending a mile north from Winthrop's Point, is within the range of rifle shot and of shells from the anchorage outside of the mouth of the river Thames. League Island is seventy miles from the mouth of the Delaware River.

The militia draft within twenty miles of Philadelphia is, in round numbers, 140,000 men, while that twenty miles around New London is but 6,000.

League Island is nearer to New York than Winthrop's Point is.

League Island does not require expensive fortifications to defend the point, while Winthrop's Point does.

2. The anchorage off League Island is three times in area that off Winthrop's Point, and a mile above.

3. League Island affords 190 acres corresponding to the mile front. The whole island, now surrounded by an embankment and a stone wall, is 410 acres, and this is offered as a gift to the government by the city of Philadelphia. The flats adjacent make up 600 acres.

Winthrop's Point to the railroad could now be had for, say, $50,000 to $75,000, and 200 acres for, say, $100,000.

Neither excavation nor embankment at League Island will be expensive from the nature of the soil; and as piling is to be employed there, the necessary filling up need be very small, and be provided either by cutting down Red Bank on the opposite side of the river, or from the cinders and slags of the furnaces, rolling mills, and other workshops for iron in the city of Philadelphia, and afterwards at the yard. At Winthrop's Point a gravel hill is to be cut down or ascended.

The subsoil of League Island is favorable to the driving of piles, a bed of gravel being reached on the old island at the distance of twenty-five feet, on the new at thirty-one, and at the extensive southern and lowest part of the island at fifty-six feet.

Heavy machinery lasts better upon good elastic piling than upon a hard surface of rock or diluvial gravel.

4. The distance of twenty-three feet water from the low-water mark at League Island is, on the average of a mile, from but one-half to one-third that at Winthrop's Point and northward.

5. The six feet tide at League Island is an advantage over the two and a half feet tide at Winthrop's Point.

The currents do not interfere materially with either locality.

6. The questions approved by the commission in August, and the resolution adopted by five votes to one in October, show that the commission intended to give full consideration to a navy yard for iron clads and iron steamers adapted to the present wants of naval warfare, and described by the honorable Secretary of the Navy in his letters to Congress, and in the debates on the subject, and not to an ordinary navy yard; to the site for a first class establishment, meeting all the requirements of an iron navy.

Hence the superior abundance and cheapness of coal and iron at League Island determines the question of the site in its favor.

7. Fresh water is indispensable for the site of a navy yard for

iron vessels; one other determining condition in favor of League Island.

8. The facility of procuring workmen is a great superiority of League Island over Winthrop's Point.

9. The placing of a navy yard within the range of rifle guns from an anchorage for large vessels is inadmissible.

Winthrop's Point is but three and one-eighth miles from the mouth of the Thames.

10. League Island is a munificent gift, which ought at once to be accepted. The recommendation of League Island is not supposed to be for an additional yard, but to replace the one now at Philadelphia, at the same time rendering the substitute a yard for the construction of an iron navy adapted to the modern improvements in naval warfare.

Therefore, in view of these conclusions and comparisons made in the foregoing, we recommend the adoption of the following resolutions, viz:—

Resolved, That the board having made a careful survey and examination of the several places and waters designated in the law and in their instructions, recommend to the honorable Secretary of the Navy to accept the munificent gift of the city of Philadelphia of League Island.

Resolved, That this report be presented to the honorable Secretary of the Navy as showing the reasons for this recommendation.

Resolved, That with this report the information collected by the board be presented to the honorable Secretary of the Navy, with the respectful request that it may be deposited in the archives of the department for safe-keeping, and that copies only be allowed to such persons as are duly authorized to use them, the originals being kept safely in the department.

JOHN MARSTON, *Captain.*
A. D. BACHE,
Superintendent United States Coast Survey.

Hon. GIDEON WELLES,
Secretary of the Navy.

CONTENTS OF THE APPENDIX.

A.—Letter of instructions of the Hon. Secretary of the Navy to the board to examine League Island, &c., August 12, 1862.

B.—Second letter of the Hon. Secretary of the Navy to the board, October 3, 1862.

C.—Report on Narragansett Bay.

D.—List of vessels which have passed up and down the Delaware from the United States navy yard to the capes since March 1861.

E.—Letter of Lieut. Comg. Phelps in relation to range of rifle cannon.

A.

NAVY DEPARTMENT, *August* 12, 1862.

SIR: I enclose herewith a copy of an act of Congress approved July 15, 1862, entitled "An act authorizing the Secretary of the Navy to accept the title to League Island, in the Delaware River, for naval purposes." The act provides "that said title shall not be accepted and received unless the same shall be perfect and indefeasible to the whole island and marsh adjacent to low-water mark; nor if, upon more thorough examination and survey of the premises by a competent board of officers to be by him appointed, he shall discover that the public interest will not be promoted by acquiring the title aforesaid." In pursuance of this act a board is hereby appointed, to be composed of yourself as presiding officer, Commodores William H. Gardner and G. J. Van Brunt, and Captain John Marston, who will have associated with them Professor A. D. Bache and Mr. W. P. S. Sanger, civil engineer. It will be the duty of the board to make a thorough examination and survey of League Island and the marsh adjacent thereto, and to report upon their capacity and fitness for naval purposes, and whether in their opinion it will be to the public interest to acquire the title thereto.

The act further provides that the board, before proceeding to any decision of these questions, shall "make a survey and exa-

mination of the harbor of New London, Connecticut, and its surroundings, with reference to its capacity and fitness for a naval depot and navy yard, and whether the public interests will not be promoted by establishing a naval depot and navy yard in or near said harbor of New London instead of League Island, and that they also make the same investigation in regard to the waters of Narraganset Bay."

The board will therefore survey and examine—*first*, the harbor of New London and its surroundings; *secondly*, the waters of Narraganset Bay; *lastly*, League Island and the marsh east of and adjacent thereto.

Having completed these duties, they will report in full to the department with reference to the capacity and fitness of the point examined for a naval depot and navy yard, and whether in their opinion the public interest will be promoted by acquiring the title to League Island for naval purposes, or by establishing a navy yard and naval depot either in or near the harbor of New London or in the waters of Narraganset Bay instead of League Island.

The board will meet at New London on the 19th instant, at which place and time the respective members thereof will report to you.

I am, respectfully, your obedient servant,

GIDEON WELLES,
Secretary of the Navy.

Rear Admiral SILAS H. STRINGHAM,
United States Navy, Brooklyn, New York.

B.

NAVY DEPARTMENT, *October* 3, 1862.

SIR: I have received your letter of the 1st instant, enclosing a resolution passed by the board appointed to examine League Island and other places, in which instructions from the Secretary of the Navy are asked as to whether, in executing the duties committed to it, the board is to select a site for an ordinary navy yard such as now exists at several points, or of a first class establishment especially for iron-clads or for iron vessels, with all

the accessories thereto; such as is contemplated in the letter of March 25, 1862, and June 9, 1862, addressed by the Hon. Secretary of the Navy to the Chairman of the Committee on Naval Affairs of the House of Representatives, and ordered to be printed June 13, 1862, and in the debates, especially setting forth the deficiencies of the preset naval establishment, and urging improvements to adapt it to the progressive changes in naval changes.

There would, I apprehend, be impropriety on my part were I to attempt to instruct the board in the duties committed to it by the law under which the members hold their appointments. The law confers on me no such authority. It requires the Secretary of the Navy to appoint a board to perform certain duties specified in the act. That appointment I have made in good faith to Congress and the country, and there the subject, so far as the department is concerned, should rest until the board has made its investigation and reported.

The object of the department, in the letters of March 25 and June 9, 1862, is, I think, explicit. They propose, not the establishment of an additional navy yard similar in character to those which we already have, but a yard of a different description, adapted to the radical changes introduced into naval architecture, where the materials of which naval vessels are constructed shall be wrought and the iron plating for armature, if deemed best, might be manufactured, or, as expressed in one of the letters, the foundation laid for an establishment meeting all the requirements of an iron navy. The views and suggestions in those letters led to the tender of League Island to the government by the city of Philadelphia for the purpose specified. Congress, however, in acting upon the subject, enumerated other places to be examined, imposed certain conditions, and required an investigation by the board of the several localities named.

The law prescribes the duties which Congress required of you, and beyond it I am not authorized to give instructions.

I am, respectfully, your obedient servant,

GIDEON WELLES,
Secretary of the Navy.

Rear Admiral SILAS H. STRINGHAM, *U. S. N.*,
President of the Board, Philadelphia, Pa.

C.

NARRAGANSET BAY.

The list of materials collected in reference to this bay will be found in Appendix No. 1.

As required by our instructions, we examined and surveyed the extensive waters of this bay, visiting all the sites which had been suggested by the examinations of previous boards, or by more recent surveys by the Coast Survey, which were suggested by local authorities, or which appeared in our inspection of the bay to present promising positions for a navy yard. Thus we examined Mount Hope Bay and its approaches in by the channel between Bristol and Rhode Island down to the old stone bridge, which now closes the eastern passage of the bay, (sometimes called Saugkonnet River,) and out by the northern shore of the Island of Rhode Island into the main channel of Narraganset Bay. Providence River, especially near Gaspee Point, was examined. The whole of the eastern side of Providence Island was very carefully examined, especially south of Sandy Point and in Potter's Cove; the western shore of Rhode Island behind Dyer's Island; the eastern shore of Connanicut, surveying Taylor's Cove, which is protected in part by Gould Island from winds, currents, and ice; visiting Newport harbor, and passing around to the western shore of Connanicut, and in by the south and out by the north entrance of Dutch Island harbor.

The surveys of this bay have developed the fact that sticky bottom for anchorage occurs generally in water too deep for convenient anchorage, except in the coves, and that deep indentations of the shore line, or coves, are few in number, and such as are found are small in extent.

The advantages of Narraganset Bay for a navy yard are, an adequate depth of water, but with the drawback just stated; that it is easy of ingress and egress, (the practicability of easy ingress with a northwest wind is now of little consequence since steam is of such common use;) is not easily blockaded; is moderately free from ice; presents full space on its islands for the erection of buildings, docks, and basins, with extensive water front; presents good foundations for the accessories of a yard; has a moderate

range of tides, and is but little exposed to freshets or overflows in any properly selected site; and is proverbial for the excellent health of the vicinity. The disadvantages are, the entrance is often difficult from fogs; that its defence will involve most costly and difficult works of permanent fortifications and of local floating batteries, or the closing of one of the two entrances now open by a dyke similar to that which closes the third entrance at the north, and defensive works and floating batteries for the main entrance; that each available site must, as a rule, depend also upon itself for defence; that the population does not furnish enough troops readily transferred to the points of attack, and the best sites are so near to the entrance of the bay as to be easily attacked, and all are upon islands; that the bay is swept by powerful winds from the northwest, southwest, northeast, and sometimes from the southeast, which raise a chopping sea, and is in some places exposed to ice; is defective in holding ground, on account of the bottom being generally rocky where the depth is less than twelve or more than four fathoms; the rocky nature of the excavation of the sites makes foundations expensive; the facility for obtaining iron and coal is small, and supplies generally require to be brought from a distance; a scant supply of fresh water generally; moderate facilities for procuring workmen, who must be domiciled on the site: all the bad effects of salt water upon wood and iron.

Advantageous, thus, as it is in some respects, we consider that, balancing the advantages and disadvantages, this bay would be an indifferent one for the location of a navy yard.

D.

List of Vessels Repaired at the United States Navy Yard, Philadelphia, since March 1, 1861.

Names.	Description.	When.	Date of departure.	Greatest draught of water.	
				Ft.	In.
St. Lawrence	Frigate	Since Mar. 1, 1861	June 29, 1861	23	6
Jamestown	Sloop	do.	June 10, 1861		
Water Witch (1st time)	Side-wheel steamer	do.	April 17, 1861	10	3
Union	Steamer	do.	May 17, 1861	11	0
Flag (1st time)	Side-wheel steamer	do.	May 29, 1861	15	6
Dobbin	Revenue cutter	do.	Oct. 4, 1861		
Keystone State (1st time)	Side wheel steamer	do.	April 20, 1861		
Louisiana	Steam propeller	do.	Aug. 7, 1861		
Susquehanna	Steam frigate	do.	Aug. 24, 1861		
Seminole	Steam sloop	do.	July 26, 1861	10	2
Allen	Revenue cutter	do.	Oct. 5, 1861		
Albatross	Steam propeller	do.	Sept 9, 1861		
Monticello	do.	do.	Sept. 23, 1861		
Brooklyn	Steam sloop	do.	Dec. 23, 1861		
State of Georgia	Side-wheel steamer	do.	Nov. 23, 1861		
Harriet Lane	do.	do.	Oct. 1, 1861		
Hatteras	Iron steamer	do.	Nov. 5, 1861		
Mystic	Steam propeller	do.	Dec. 11, 1861		
Kittatinny	Three-mast schooner	do.	Dec. 13, 1861		
St. Louis	Sloop	do.	Jan. 31, 1862		
White Hall	Steamer	do.	Oct. 30, 1862		
Elan	do.	do.	Oct. 29, 1861		
Samuel Rotan	Schooner	do.	April 8, 1862		
Rachel Seamer	do.	do.	Nov. 7, 1861		
James S. Chambers	Three-mast schooner	do.	July 30, 1862		
Keystone State (2d time)	Side-wheel steamer	do.	July 19, 1861		
Princeton	Receiving ship	do.			
Flag (2d time)	Side-wheel steamer	do.	Aug. 19, 1861		
Adolph Hugel	Bomb schooner	do.	Jan. 11, 1862		
George Mangham	do.	do.	Jan. 11, 1862		
Maria A. Wood	Schooner	do.	Nov. 19, 1861		
James L. Davis	Bark	do.	Jan. 2, 1862		
Live Yankee	Side-wheel steamer	do.	Jan. 13, 1861		
Rescue	Iron tug	do.	Aug. 31, 1861		
Ice Boat	Side-wheel steamer	do.			
Delaware	Iron steamer	do.	Dec. 11, 1861		
Wissahickon	Steam gunboat	do.	Nov. 25, 1861	10	6
Itasca	do.	do.	Dec. 9, 1861		
Florida	Side-wheel steamer	do.	Nov. 4, 1861		
Hartford	Steam sloop	do.	Jan. 20, 1862	17	2
Powhatan (2d time)	Steam frigate	do.	Aug. 25, 1862	20	0
Scioto	Steam gunboat	do.	Dec. 17, 1861		
Tahoma	do.	do.	Dec. 27, 1861		
Union (2d time)	Steamer	do.			
Rhode Island	Side-wheel steamer	do.	Feb. 5, 1862		

List of Vessels Repaired, &c.—Continued.

Names.	Description.	When.	Date of departure.	Greatest draught of water.	
				Ft.	In.
Wamsutta	Steam gunboat	Since Mar. 1, 1861	April 4, 1862		
Aroostook	do.	do.	Mar. 31, 1862		
Water Witch (2d time)	Side-wheel steamer	do.	Sept. 11, 1862		
Bienville	do.	do.	April 10, 1862		
Forward	Revenue cutter	do.	April 25, 1861		
Keystone State (3d time)	Side-wheel steamer	do.	Dec. 7, 1861		
St Lawrence	Frigate	do.	Mar. 17, 1862		
Rhode Island (2d time)	Side-wheel steamer	do.	April 5, 1862		
Jamestown (2d time)	Sloop	do.	Still at yard		
Brazillerio	Bark	do.	June [illegible] 1862		
Bienville (2d time)	Side-wheel steamer	do.	June 25, 1862		
Massachusetts	Steamer	do.	July 14, 1862		
Cimeron	Side-wheel steamer	do.	July 5, 1862		
Mohican	Steam sloop	do.	Still at yard		
Wabash (2d time)	Steam frigate	do.	Aug. 1, 1862	23	6
Wissahickon (2d time)	Steam gunboat	do.	Still at yard		
Quaker City	Side-wheel steamer	do	do.	13	0
Potomska	Gunboat steamer	do.	Sept. 15, 1862		
New Ironsides	Iron-clad steamer	do.	Aug. 21, 1862	15	9
New Ironsides (2d time)	do.	do.	Still at yard		
Pocahontas	Steam gunboat	do.	do.		
Augusta	Side-wheel steamer	do.	do.		
Stars and Stripes	Steam gunboat	do.	do.		
Daylight	do.	do.	do.		
Saratoga	Sloop	Before Mar. 1, 1861	Nov. 15, 1860	17	0
Powhatan (1st time)	Steam frigate	do.	Aug. 31, 1860		
Crusader	Steam guuboat	do.	Oct. 6, 1859	11	3
Congress	Frigate	do.	Aug. 4, 1859	23	0
Chapin	Steam gunboat	do.	Dec. 1, 1858		
Saranac	Steam frigate	do.	Oct. 8, 1857	18	9
Jamestown	Sloop	do.	Dec. 24, 1857	17	8
Minnesota	Steam frigate	do.	May 28, 1857	22	5
Preble	Sloop	do.	June 15, 1857	15	6
Susquehanna	Steam frigate	do.	May 16, 1856	20	7
St. Louis	Sloop	do.	Nov. 10, 1855	16	8
San Jacinto (2d time)	Steam frigate	do.	April 12, 1855	18	3
Fulton	Steamer	do.	Nov. 23, 1853	10	10
Cyane	Sloop	do.	Dec. 20, 1853		
Jamestown	do.	do.	Feb. 22, 1855	17	11
San Jacinto (1st time)	Steam frigate	do.	Aug. 9, 1854	18	0
St. Mary	Sloop	do.	Oct. 14, 1853	17	6
Vandalia	do.	do.	Mar. 5, 1853	16	6
Preble (1st time)	do.	do.	April 2, 1853		
Mississippi	Steam frigate	do.	Mar. 20, 1852	18	0
Saranac	do.	do.	Oct. 4, 1852		

List of Vessels Built at Navy Yard, Philadelphia.

Names.	Description.	When.	Date of departure.	Greatest draught of water.
				Ft. In.
Relief	Storeship	1836	Dec. 8, 1836	
Pennsylvania	Ship-of-the-line	1837		
Dale	Sloop	1839	Dec. 10, 1839	
Mississippi	Side-wheel steamer	1841	Feb. 15, 1842	18 6
Raritan	Frigate	1843		
Princeton	Steamer	1843		
Germantown	Sloop	1846		18 0
Susquehanna	Side-wheel steamer	1850	Dec. 26, 1850	18 0
Arctic		1855	May 12, 1855	13 0
Martin's Industry	Light ship	1855	Dec. 22, 1855	9 10
Wabash	Steam frigate	1855	Sept. 4, 1856	23 6
Shubrick	Lt. Ho. Estab't	1857		
Light ship, No. 1		Jan. 1858	July 9, 1858	
Light ship, No. 2		June 1858	July 3, 1858	
Lancaster	Steam sloop	1858	June 8, 1859	18 6
Wyoming	do.	1859	Oct. 5, 1859	13 0
Pawnee	do.	1859	Sept. 24, 1860	11 0
Tuscarora	do.	1861	Dec. 6, 1861	13 0
"Miami"	Side-wheel steamer	1861	Jan. 29, 1861	7 0
Juniata	Steam sloop	1862	Still at yard	14 0
Monongahela	do.	1862	do.	14 0

E.

PHILADELPHIA, PA., *October* 16, 1862.

DEAR SIR: Your letter of this instant is this moment received, and in regard to the Corwin's rifled guns I have respectfully to state that they were made by Alger, of Boston, in 1844, for the army six-pounder field pieces, but owing to their weight (875 pounds each) were sold, and purchased by me for the Coast Survey in 1860. They were rifled by Alger. Diameter of bore, 3.80 inches. Length of gun, I think, 65 inches.

The projectiles used are the *Hotchkiss* shot and shell, the best I have met with in the service.

I do not recollect the point-blank range.

The greatest range obtained at Hatteras Inlet was about four and a half ($4\frac{1}{2}$) nautical miles; distance obtained by triangulation; elevation about 25°.

At Yorktown, with 28° elevation, the greatest distance obtained was a fraction under five (5) miles. The position of the Corwin was obtained by cross bearing platted on a Coast Survey chart, and distant from the 100-pounder rifled gun of the rebels (mounted on the northeast angle of their works) about ten yards under four (4) miles. One shell, with 25″ fuze, exploded in a camp rather more than half a mile beyond Yorktown, and killed five men. The entire distance was estimated to be nearly five miles. I have in my possession a fragment of the shell.

The Corwin was anchored about three and three-fourths ($3\frac{3}{4}$) miles from Gloucester Point; and with from 22° to 24° elevation they threw beyond the Point, as was proved by the movements of the enemy's shipping, and afterwards by the testimony of people stationed at the Point.

The weight of the projectiles was thirteen (13) pounds.

I am, respectfully, your obedient servant,

THOS. S. PHELPS,
Lieut. Comd'g.

Prof. A. D. Bache, LL. D.,
Superintendent U. S. Coast Survey.